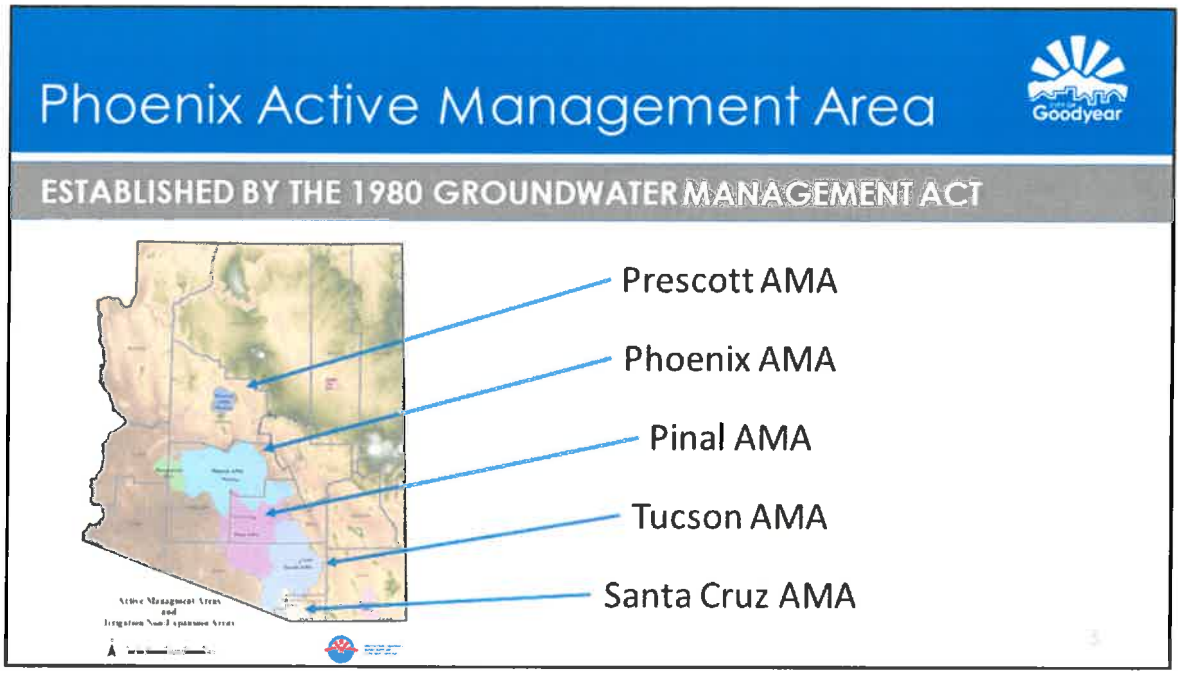

CITY OF
Goodyear
WATER CONSERVATION COMMITTEE
August 16, 2016

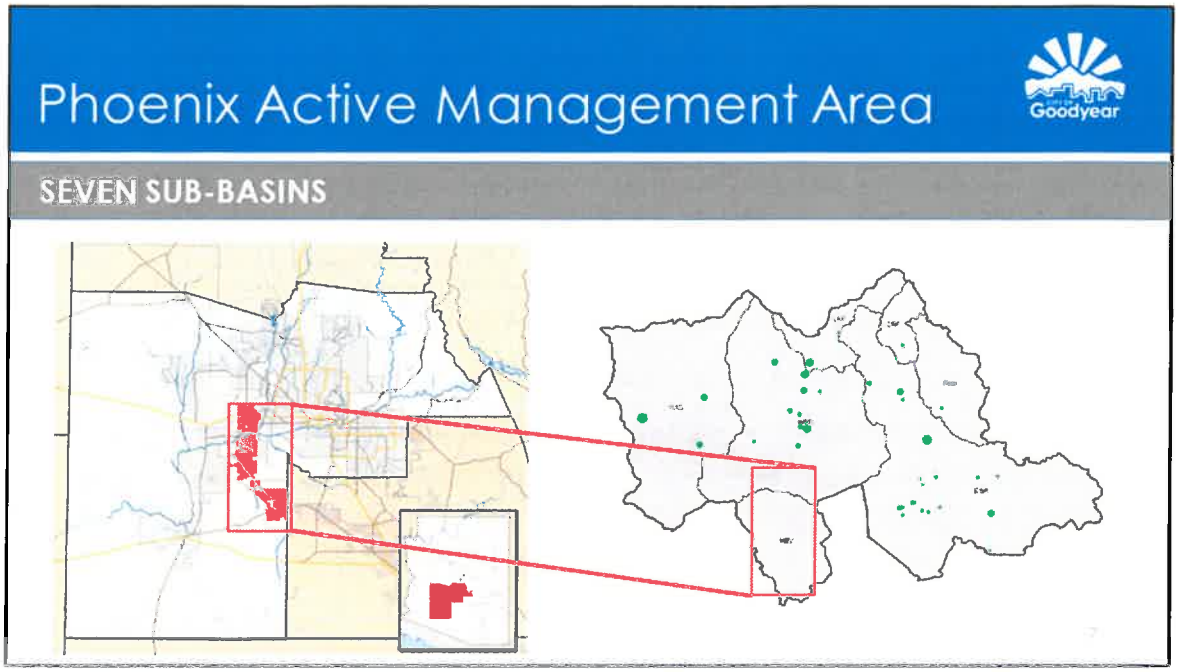
Presentation Overview

AGENDA

- 1980 Groundwater Management Act
- Phoenix Active Management Area
- City's Geographic and hydrologic setting
- Designation of Assured Water Supplies
- Water Resources portfolio
- Water demands, supplies, and physical availability
- Questions
- Reclaimed Water – Direct versus indirect usage
- Colorado River Water
- Recharge, Sustainability, and drought preparedness
- Questions
- Build-out water supply needs
- Water Planning Areas of the City
- Water supply needs and water transportation
- "Effective" water conservation
- Water conservation modeling
- Questions



1. The State has created five active management areas (AMAs) where groundwater mining is occurring since the 1980 Groundwater Management Act. Within these areas no new groundwater supplies can used for land development and renewable water supplies are required for establishing an assured water supply for new land development.



1. The Phoenix AMA is comprised of seven (7) groundwater sub-basins. The City of Goodyear geographically lies over two (2) sub-basins. The northern portion of the City, from about Pecos Road to the northern boundary of the City reside within the West Salt River Sub-Basin. The majority of the City's geographical area reside in the south over the Rainbow Valley Sub-Basin.

Assured Water Supply

DESIGNATED PROVIDER

Designation of an Assured Water Supply

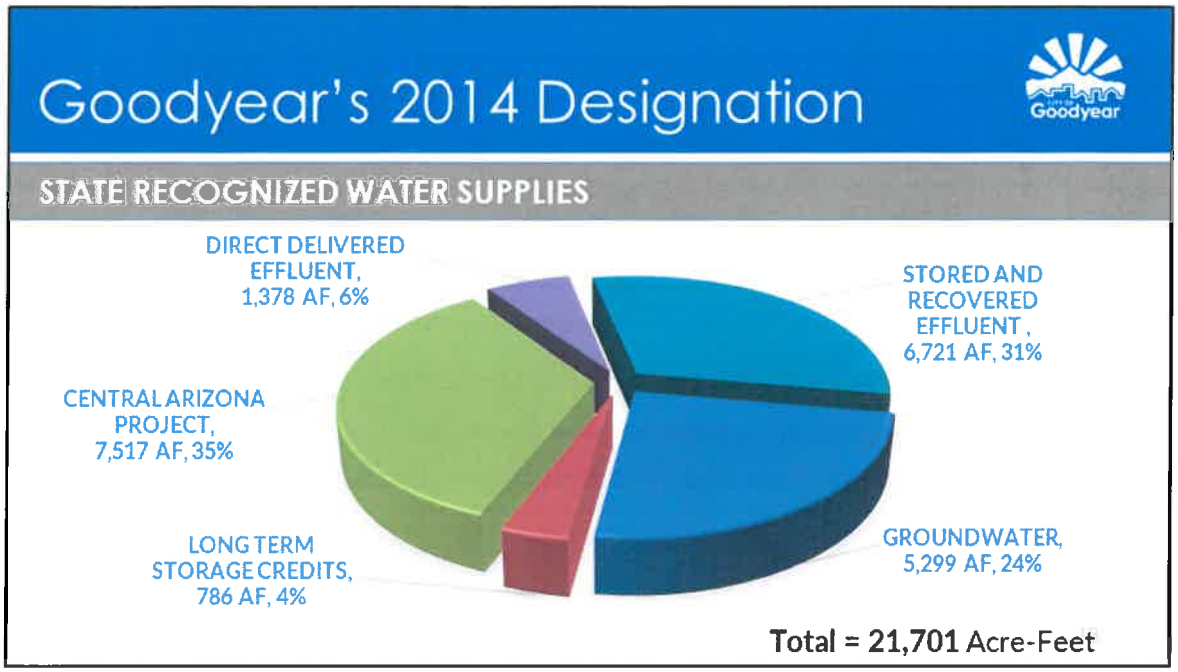
1. Is a consumer protection program whereby a water provider demonstrates
   - ✓ A 100 year water supply
   - ✓ How groundwater will be preserved
   - ✓ How long term water planning will be promoted
2. The Arizona Department of Real Estate requires an assured water supply for development to issue a public report and sell lots.
3. The Arizona Department of Water Resources Assured Water Supply program operates to sustain the state's economic health by preserving groundwater resources and promoting long-term water supply planning.

1. The City has proven that is has an assured water supply and has been classified as a designated water provider meaning that the City can work with land developers on its own and the City controls its destiny. The designation of assured water supplies is re-assessed every fifteen years by the State of Arizona under mandate of State law to ensure a designated water provider stays ahead of water demands associated with growth.

Assured Water Supply

DESIGNATED PROVIDER

1. **PHYSICAL WATER AVAILABILITY-** Hydrologic study to evaluate groundwater demands for all area water users for 100-years
2. **CONTINUOUS WATER AVAILABILITY** - Water providers must demonstrate that the water supplies are uninterruptible for 100-years
3. **LEGAL WATER AVAILABILITY** - Evaluation of all legal water rights of the water provider



1. The Arizona Department of Water Resources (ADWR) recently issued a decision and order for the City's designation of assured water supplies for 2014. ADWR determined that the City had access to a total of 21,701 acre-feet of water per year for 100-years. The total volume of water was comprised of various types of water supplies.

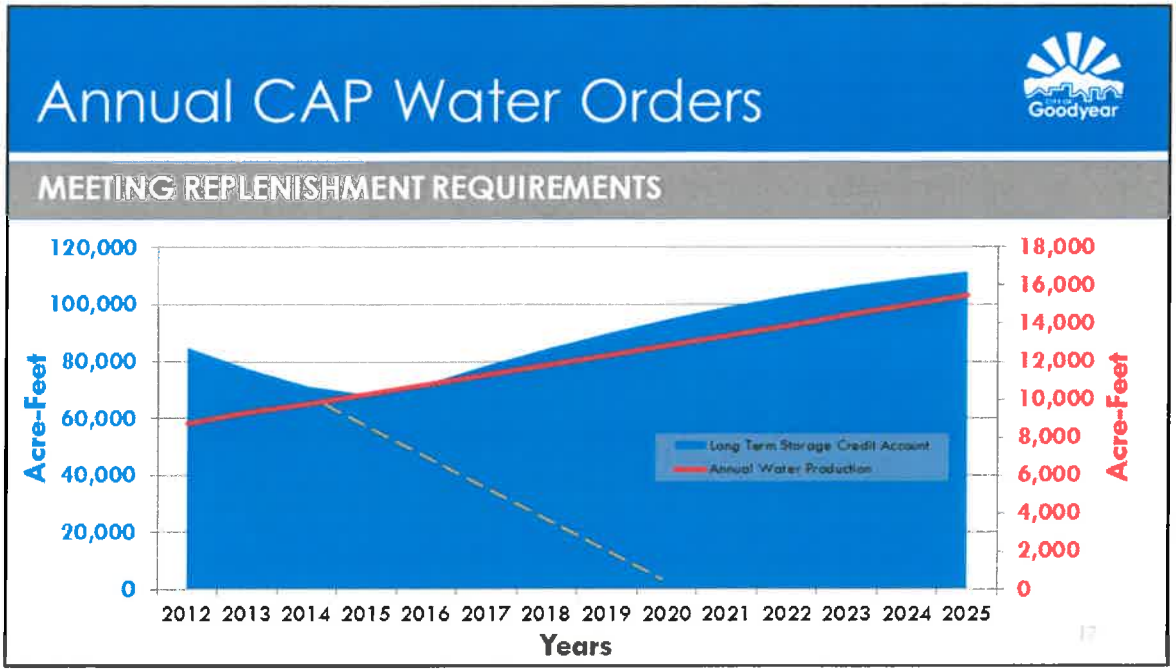
Goodyear's Total Water Portfolio

NOT ALL WATER RECOGNIZED BY THE STATE

Why did Arizona Department of Water Resources recognize only a portion of the city's total water resources?

1. The city cannot currently treat and deliver its CAP water directly
2. City CAP water must be delivered to CAP owned and operated recharge facilities with 20-year permits

Central Arizona Project (CAP)



This is a chart showing the historic and future predicted long term storage credit bank account in blue color. The City started to order its CAP water in 2012 and has now caught up to the current total annual water demands shown by the red line. Therefore, because the City is ordering its CAP water to meet annual water demands it can store reclaimed water underground and grow the water bank account to use for future needs.

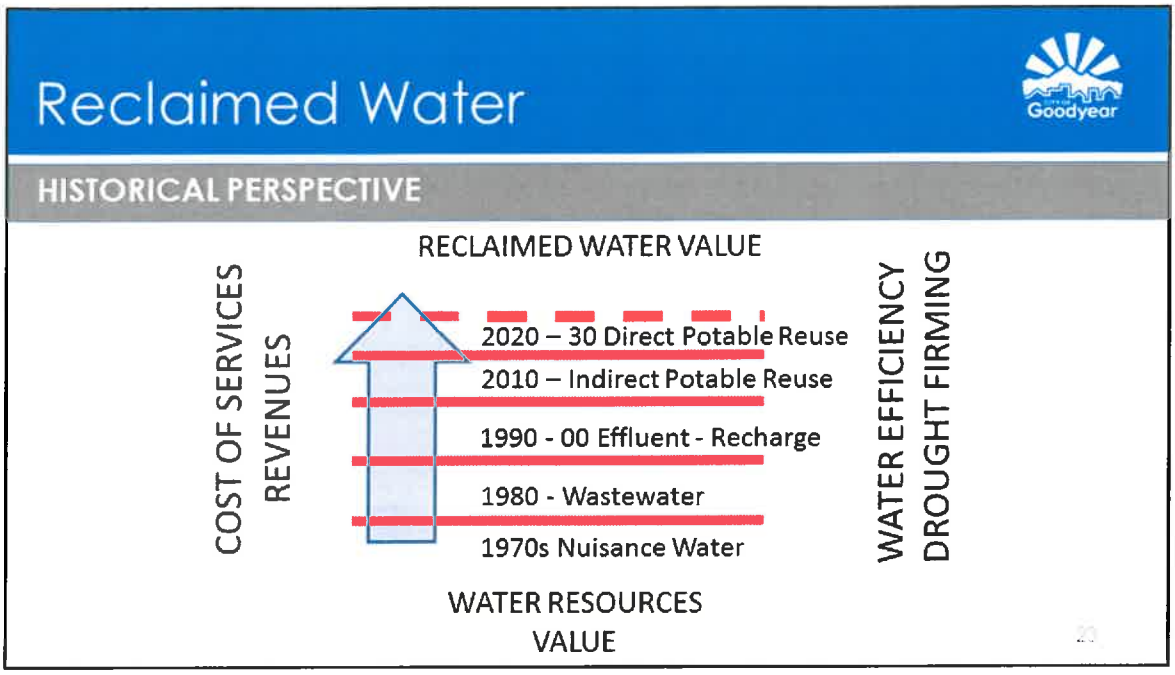
Physically Available Water Supplies

NEW DESIGNATION 2014

Based on the recent designation of assured water supplies application

- ✓ Besides other assured water supply holders; as of today there are approximately 13,602 acre-feet/year of physically and continuously available (wet) water (groundwater) within the areas of projected growth.
- ✓ Any wet water (physically and continuously available) above this amount will need to be imported from somewhere else.


Questions or Comments?
21



Since the 1970s the costs of services have increased, requiring rate increases to generate revenues to cover the costs of services. Due to now-scarce water supplies, the value of water resources is increasing dramatically. There have been significant water efficiency improvements allowing water to be stretched further. Water providers have banked significant water supplies in preparation for shortages caused by drought. Reclaimed water is now being banked for future needs. All of these factors have increased the value of reclaimed water to that of potable water supplies whereby direct potable reuse is now being contemplated within Arizona.

Arizona Governing Laws

RECLAIMED WATER

1994 – Arizona Revised Statutes §45-801

1. Created legal framework and credit system for the recharge, storage, and recovery of renewable water supplies: 1) reclaimed; 2) Colorado River water; or 3) in-state surface water.

2. Ensured that the State of Arizona was using its full entitlement of Colorado River water and storing that water underground for drought protection.

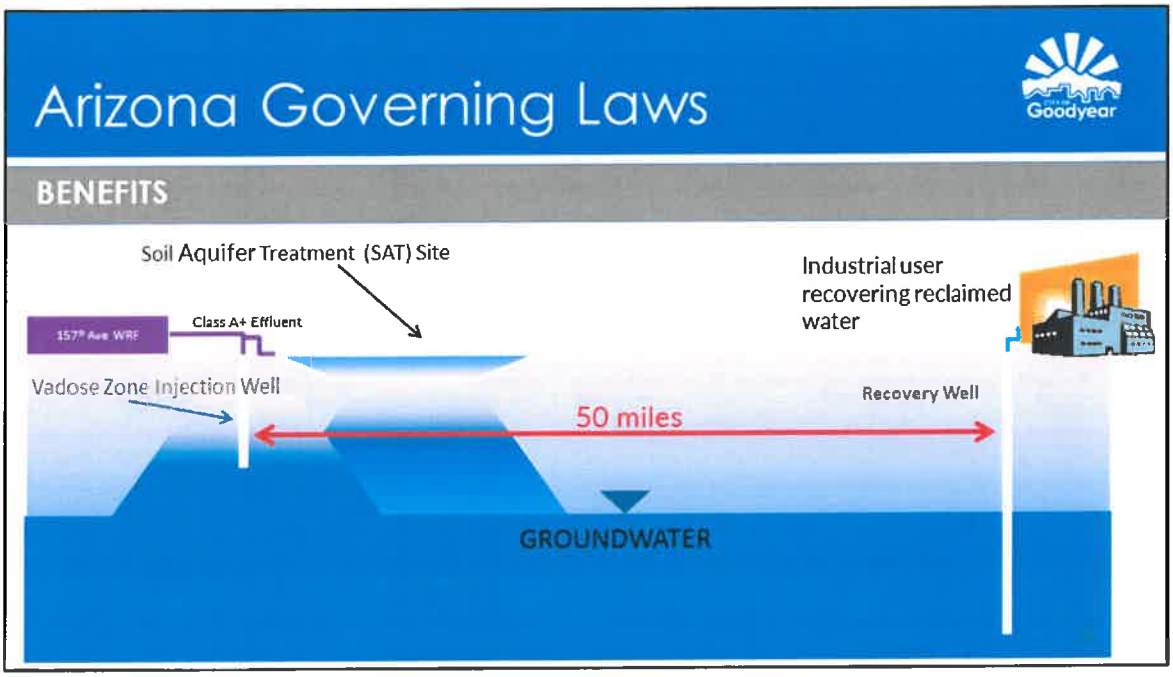
Arizona Governing Laws

RECLAIMED WATER

1. The aquifer would become the water treatment plant – through the infiltration of reclaimed water at a recharge facility.

2. The aquifer would act like the piping between where water is recharged and where water is recovered via groundwater / recovery well.

3. This law in-effect replaced the requirements for purple pipe.



This is a cartoon showing a cross-section of the West Salt River Sub-Basin where reclaimed water is being recharged either by a SAT site or vadose zone injection wells and is recovered potentially 50 miles away. The aquifer is acting like the conduit between where water is stored and the recovery of that water via a well.

Direct Delivered Reclaimed

PURPLE PIPE

1. Delivered from reclamation facilities at a reduced rate for water intensive uses that include:
   - Turf Facilities
   - Agricultural uses
   - Recreational Amenities
   - Electric Generation
   - Industrial uses

2. Directly delivered through a secondary infrastructure – "Purple Pipe" in addition to a potable system – significantly *increasing* or in some instances doubling the costs of services

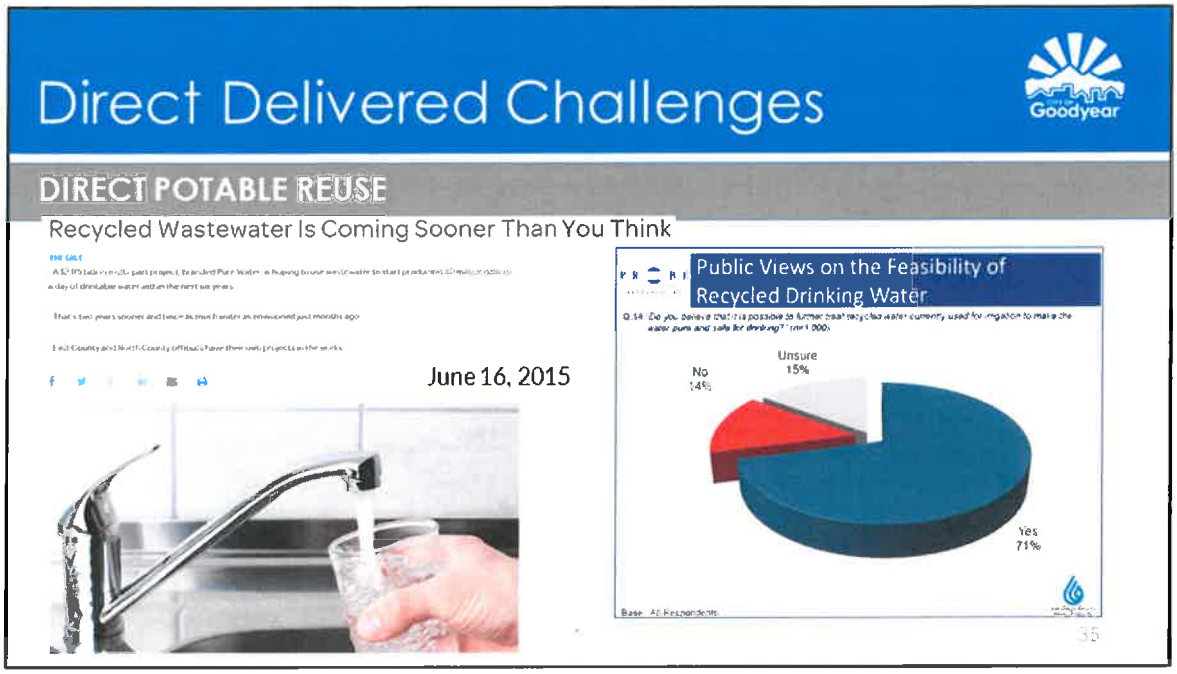
31

Purple refers to the standard labeling/paint used on reclaimed water piping to distinguish it from water treated to drinking water standards.

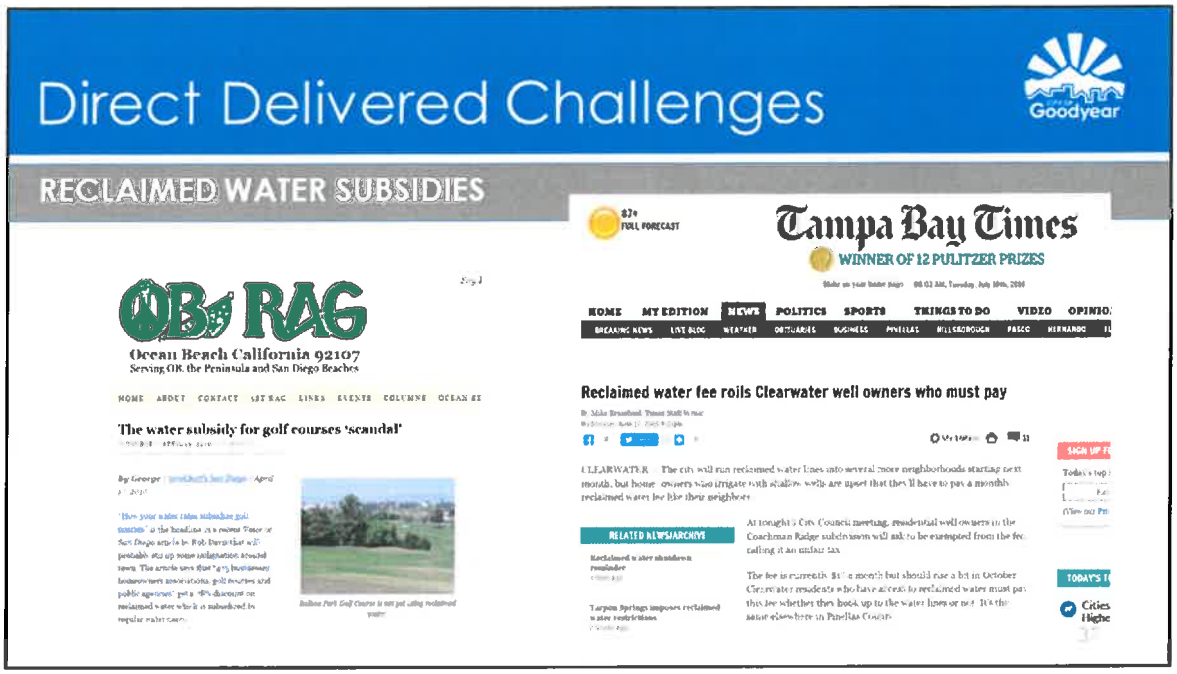
Direct Delivered Challenges

PURPLE PIPE

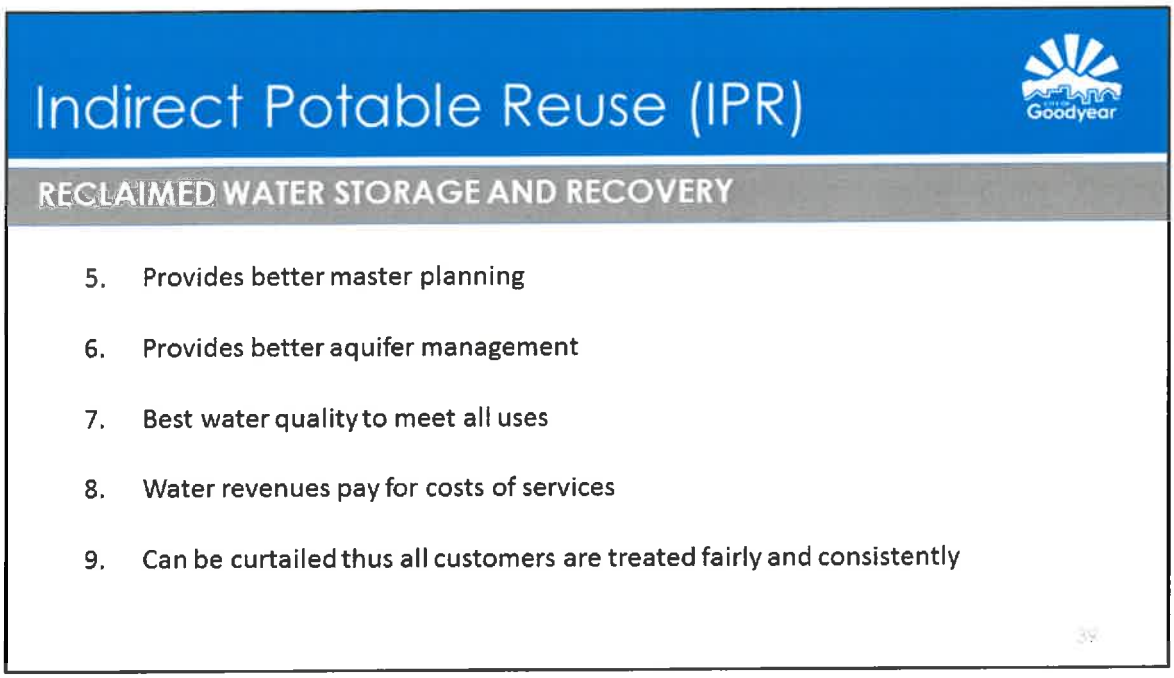
5. Water Quality issues – salinity and total dissolved solids can create challenges for many uses
6. Reduced revenues may not pay for "purple pipe" system cost of services
7. Direct non-potable water sold at a significantly reduced rate
   a) Is a discounted water supply used as efficiently or sustainably as compared to the more expensive potable water?
8. During future shortages would curtailments affect direct non-potable users based on disposal issues?



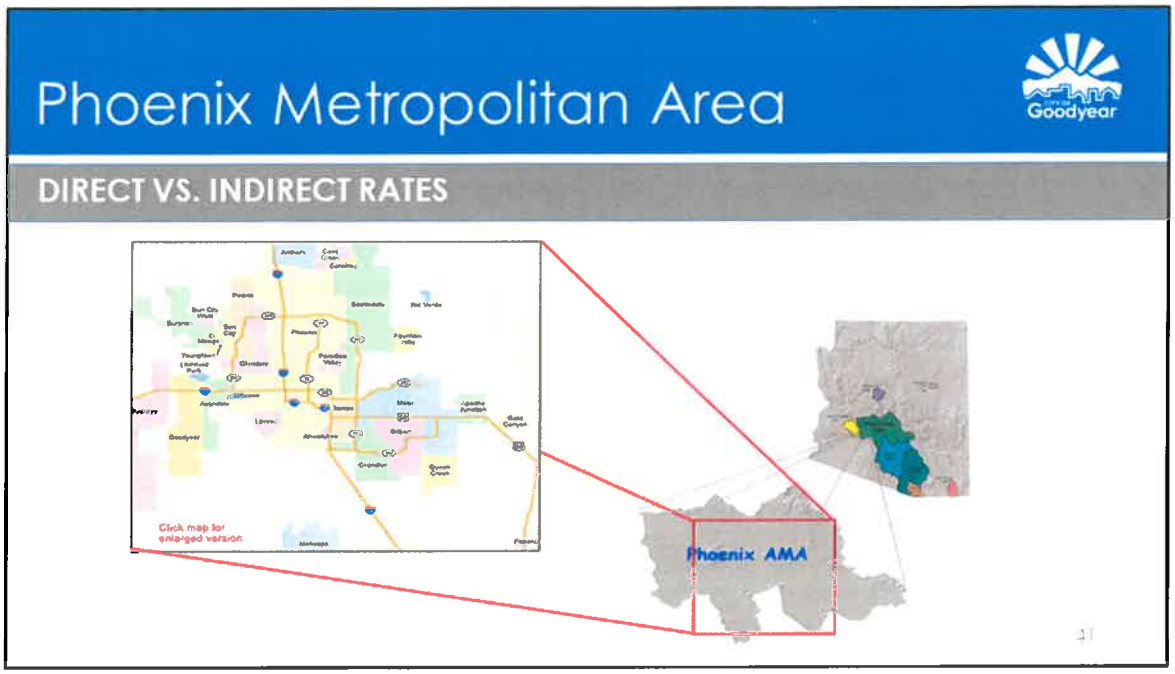
The San Diego Gist reported that in 2015 that 71 % of San Diego residents have accepted direct potable reuse of reclaimed water and were happy it was coming early.



A headline from the Ocean Beach Rag discussing a water subsidy for golf courses as a scandal. Also the Tampa Bay News headline discussing well owners will have to pay a reclaimed water fee even if they are not using reclaimed water like their neighbors.



IPR has additional advantages.



Map showing various Phoenix metropolitan municipalities.

Drought Proofing and Future Water Supply

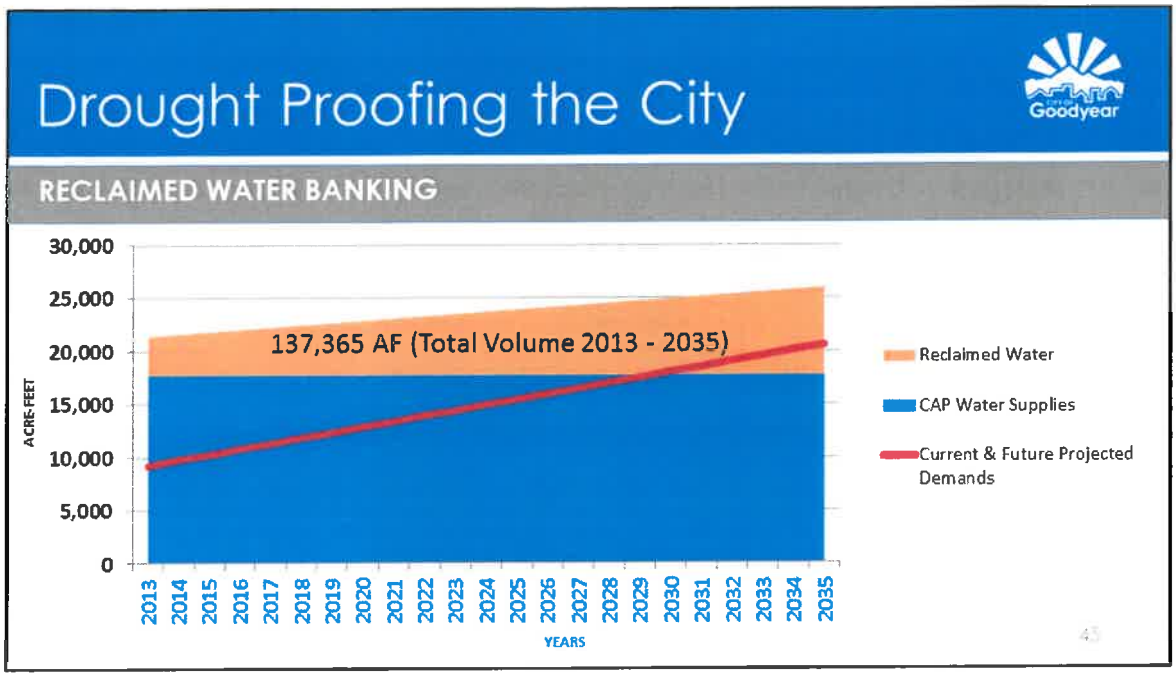
RECLAIMED WATER

1. The city's largest water resource component (56%) is its CAP water
   - ✓ CAP water is subject to shortages on the Colorado River

2. In the future beyond 2030 when the city is ordering and using all of its CAP water;
   - ✓ How can the city ensure "it's business as usual" from significant shortages affecting its annual CAP water orders for the next 100 years?
   - ❖ Having a robust long term storage credit bank account

43

Retaining reclaimed water for the future can help the city prepare for drought.

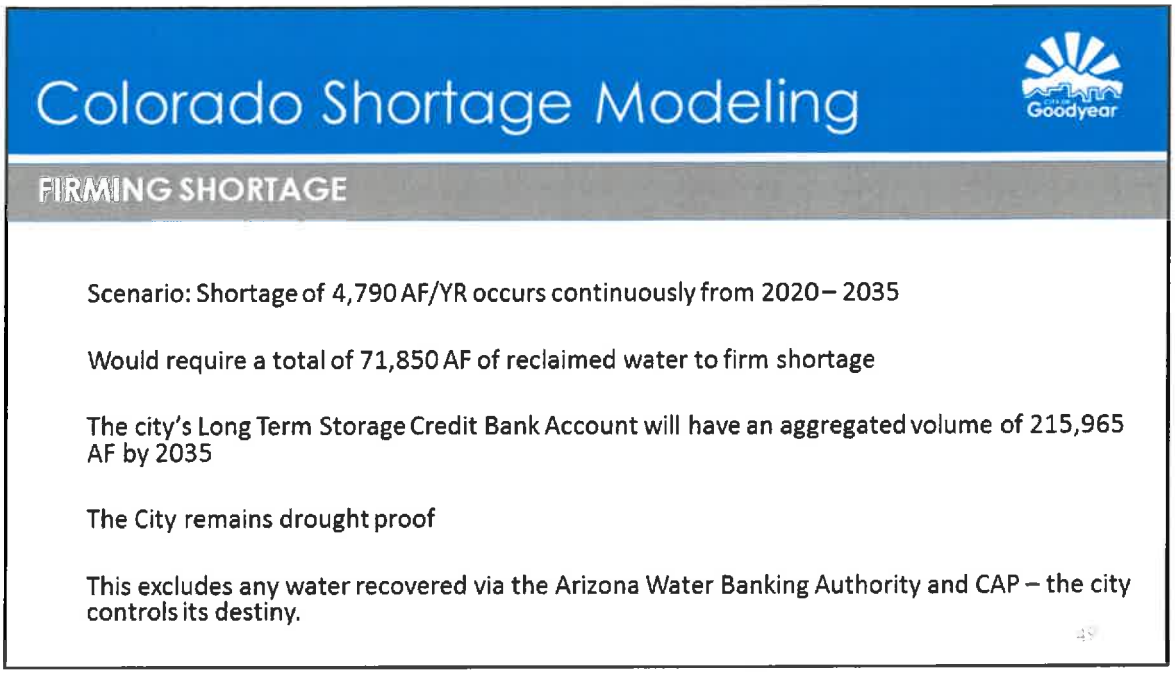


This is a chart showing several important pieces of information. 1. Water demands from 2013 through 2035 are projected to increase and shown by the red line. 2. The City will continue to meet these projected demands by utilizing its CAP water supplies. However, the CAP water supplies will become fully allocated for the demands in the year 2030. 3. Water demands beyond 2030 will need to be met with other water supplies. 4. The City is able to recover 40% of the total water delivered via the water reclamation system. This water can be either recharged and stored or used in the best interests of the City.

The Colorado River Basin Setting

ARIZONA AND CAP JUNIOR WATER RIGHT

- Arizona – Lowest priority right on the entire Colorado River
- Central Arizona Project – lowest priority right within Arizona
  - Any Colorado River shortages – CAP customers will be first to be shorted
- US Bureau of Reclamation's recent Basin Study predicts that shortages on the Colorado River could be significant and extend for long periods of time.



In this shortage model, the city simulates a 4,790 acre-feet CAP shortage for 15 years to evaluate if the city would be impacted or if the city could firm this modeled prolonged shortage.

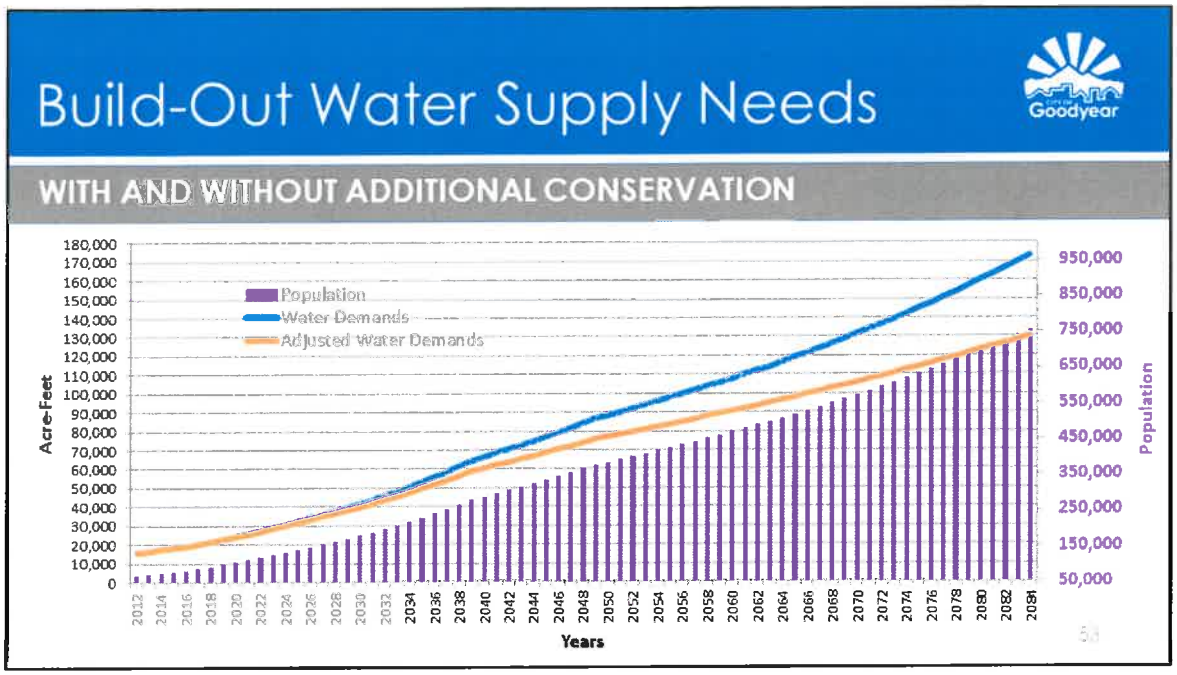
Policy Change Reclaimed Water

NO EXPANSION OF DIRECT DELIVERED RECLAIMED WATER

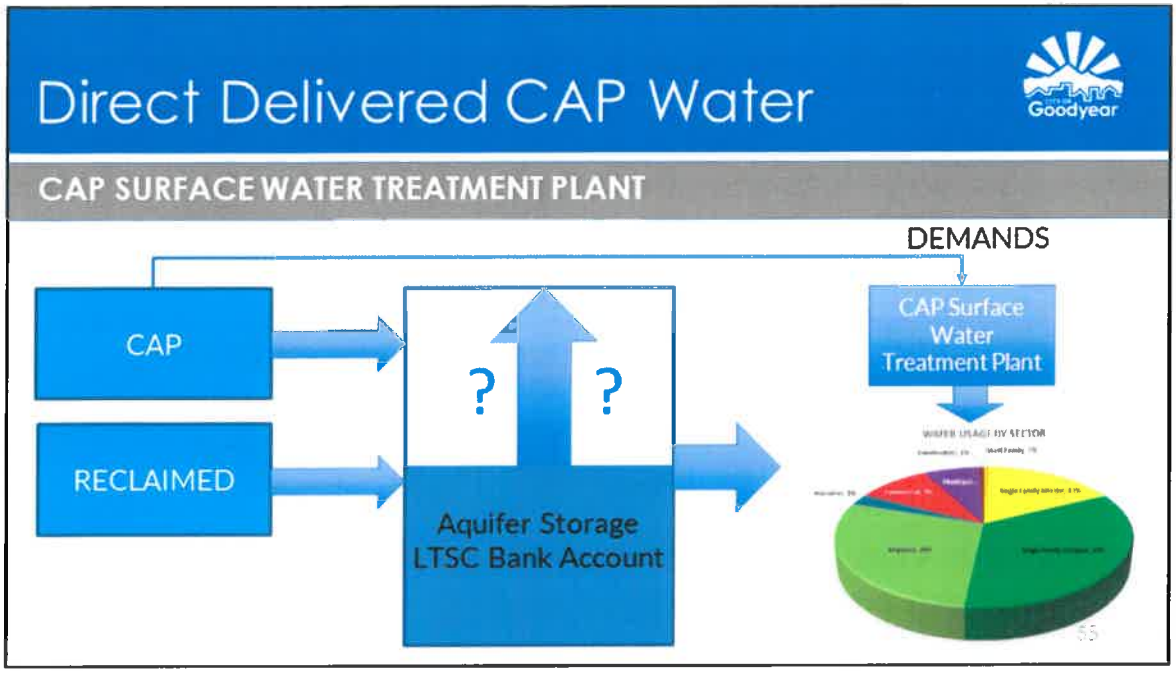
Policy Discussion

1. Purple Pipe is <u>not</u> required - Modify the Engineering Design Standards and Policies Manual
2. The city intends to recharge to the greatest extent possible its reclaimed water supplies - Code of Ordinances
3. The city will recover reclaimed water through Indirect Potable Reuse (IPR) and work towards Direct Potable Reuse
4. The city would only directly deliver reclaimed water to an entity or project via a special exception within the Code of Ordinances when it's in the City's best interest.
   - ✓ Need to define the criteria meeting the special exception
     - Reclaimed water use by an industry with need of non-potable water for processing with a return of 80-90% via the sewer collection system

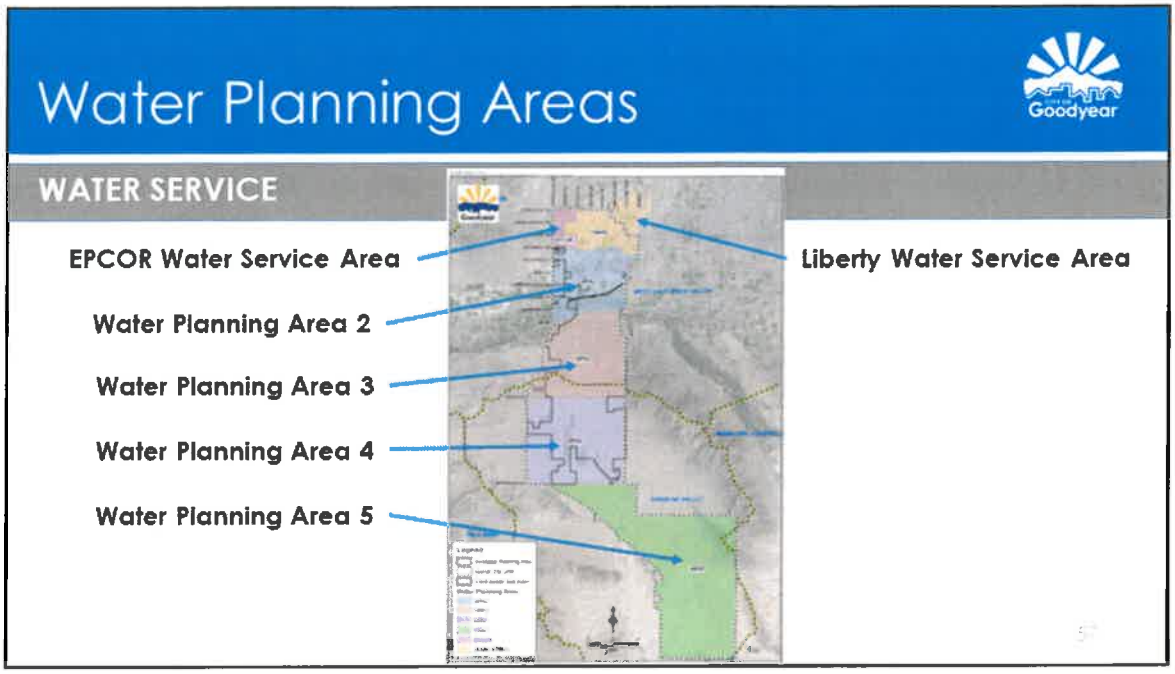
51



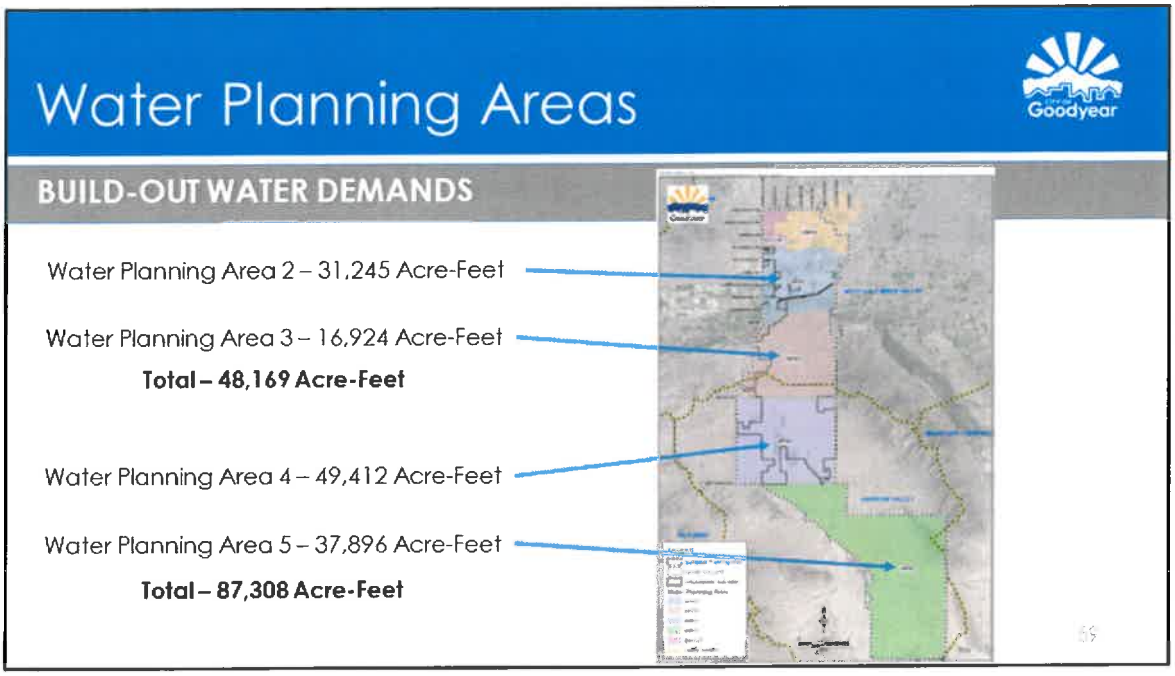
This is a chart showing the projected build-out population for the entire incorporated city. This chart portrays the city as the sole water provider. Therefore, based on the projected build-out population of the city, it would need approximately 175,000 acre-feet per year to meet the Assured Water Supply demands if it continued development at status quo efficiencies. However, if the city were able to achieve 5% new water conservation every 6 years until build-out, the total amount of Assured Water Supplies needed would be only approximately 135,000 acre-feet.



The City of Goodyear will need to directly delivery CAP water to the city for the following reasons. (See next slides)



The City of Goodyear is divided into water planning areas to better assess the needs and resource availability for each of these areas.

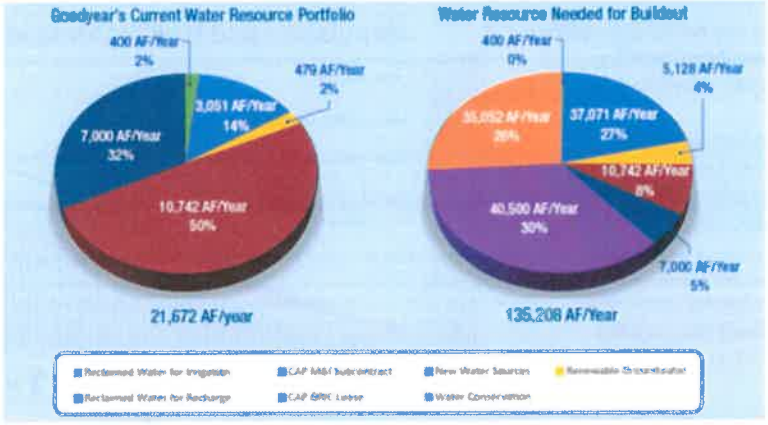


Due to physical groundwater availability limitations more than 35,000 acre-feet of new water will be needed and require transportation to WPA 2 & 3. More than 47,000 AF of new water will be needed and require transportation to WPA 4 & 5.

"Effective" Water Conservation

HOW MUCH WILL BE NEEDED

If the City was successful in "Effective Conservation" of slightly more than 35,000 acre-feet – the City would only need to obtain slightly more than 48,000 acre-feet in new water supplies



Conserving Effectively (>35,000 acre-feet per year equivalent) could reduce the amount of water needed at build-out by 26%.


Questions or Comments?
63